

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF THE CLAIMS:

Claims 1 – 8 (Canceled)

9. (Currently Amended) A method for monitoring and controlling wavelengths of an optical transmitter module or optical transmitter and receiver module internally including: a measurement portion for measuring a laser diode temperature and bias current or only the temperature; a storage portion in which the relationship between the temperature, bias current and wavelengths or between the temperature and wavelengths is stored; a central controlling portion for controlling the measurement portion and the storage portion; and a temperature adjusting portion composed of a temperature controlling device, wherein the method comprising steps of:

calculating wavelength information on the basis of the temperature and bias current or only the temperature measured by the measurement portion, and the relationship between the laser diode temperature and wavelengths or between the laser diode temperature, bias current and wavelengths stored in the storage portion; and

comparing predetermined minimum and maximum threshold values, with the wavelength information calculated in the step of calculating wavelength information;

lowering the internal temperature by the temperature adjusting portion when the result of the comparing step is smaller than or equal to the minimum threshold value;
and

raising the internal temperature by the temperature adjusting portion when the result of the comparing step is larger than or equal to the maximum threshold value.

adjusting and controlling the internal temperature by feeding back to the temperature adjusting portion using the calculated wavelength information.

10. (Canceled)

11. (Currently Amended) The method for monitoring and controlling wavelengths according to Claim 10 9, wherein,

the step of calculating wavelength information uses the temperature and bias current or only the temperature measured by the measuring portion, and the relationship between the laser diode temperature and wavelengths or between the laser diode temperature, bias current and wavelengths stored in the storage portion, and calculates wavelength information by obtaining λ_c , i_c , a , and b in Equation (1) or λ_c and a in Equation (2);

$$\lambda = \lambda_c + aT + b(1 - i_c) \quad \text{Equation (1)}$$

$$\lambda = \lambda_c + aT \quad \text{Equation (2)}$$

(where λ_c is a wavelength at temperature 0°C and threshold current value i_c , a and b are coefficients, T is a temperature, and i is a bias current).

12. (Currently Amended) The method for monitoring and controlling wavelengths according to Claim 10 9, wherein

the step of calculating wavelength information selects a smaller temperature value T_1 than the measured temperature T_{mes} , a larger temperature value T_2 than the measured temperature T_{mes} , a smaller bias current value i_1 than the measured bias current i_{mes} and a larger bias current value i_2 than the bias current value i_{mes} by using the temperature and bias current measured by the measurement portion, and the relationship between the laser diode temperature, bias current and wavelengths stored in the storage portion; extracts four wavelengths ($\lambda_{11} = \lambda(i_1, T_1)$, $\lambda_{21} = \lambda(i_2, T_1)$, $\lambda_{12} = \lambda(i_1, T_2)$, and $\lambda_{22} = \lambda(i_2, T_2)$ corresponding thereto; and calculates the wavelength $\lambda_{mes1} = \lambda(i_{mes}, T_1)$ at the measured bias current i_{mes} by linearly interpolating the bias current dependency of the wavelengths at temperature T_1 using λ_{11} and λ_{21} ; calculates the wavelength $\lambda_{mes2} = \lambda(i_{mes}, T_2)$ at the measured bias current i_{mes} by linearly interpolating the bias current dependency of the wavelength at temperature T_2 using λ_{12} and λ_{22} ; and calculates the wavelength $\lambda_{mes} = \lambda(i_{mes}, T_{mes})$ at the measured bias current i_{mes} and temperature T_{mes} by linearly interpolating the temperature

dependency of the wavelength at the measured bias current I_{mes} using the calculated λ_{mes1} and λ_{mes2} .

13. (Currently Amended) The method for monitoring and controlling wavelengths according to Claim 10 9, wherein

the step of calculating wavelength information selects a smaller temperature T_1 than the measured temperature T_{mes} , a larger temperature T_2 than the measured temperature T_{mes} , a smaller bias current I_1 than the measured bias current I_{mes} , a larger bias current I_2 than the measured bias current I_{mes} , and a bias current I_3 differing from the bias currents I_1 and I_2 by using the temperature and bias current measured by the measurement portion and the relationship between the laser diode temperature, bias current and wavelengths stored in the storage portion; extracts six wavelengths ($\lambda_{11} = \lambda(I_1, T_1)$, $\lambda_{21} = \lambda(I_2, T_1)$, $\lambda_{12} = \lambda(I_1, T_2)$, $\lambda_{22} = \lambda(I_2, T_2)$, $\lambda_{31} = \lambda(I_3, T_1)$), and $\lambda_{32} = \lambda(I_3, T_2)$ corresponding thereto; approximates the bias current dependency of the wavelength at the temperature T_1 by a quadratic function using λ_{11} , λ_{21} and λ_{31} ; approximates the bias current dependency of the wavelength at the temperature T_2 by a quadratic function using λ_{12} , λ_{22} and λ_{32} ; and calculates the wavelength $\lambda_{mes} = \lambda(I_{mes}, T_{mes})$ at the measured bias current I_{mes} and temperature T_{mes} .

14. (Currently Amended) The method for monitoring and controlling wavelengths according to Claim 10 9, wherein the step of calculating wavelength information extracts a wavelength by causing the measured temperature and bias current to correspond to any one of the temperatures stored in matrices indicating the relationship between the laser diode temperature and wavelengths or between the laser diode temperature, bias current and wavelengths stored in the storage portion.

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Currently Amended) A method for monitoring and controlling wavelengths according to any one of Claims 9, 11 12, 13, 14, further comprising a laser diode drive current controlling circuit which controls the drive current of the laser diode, wherein, the method further comprising, before the step of calculating wavelength information, steps of:

comparing predetermined minimum and maximum threshold values, threshold values of an optical output alarm or warning, in which the minimum value and maximum value of optical output are predetermined, with the optical output measured by the measurement portion; and

raising the bias current by the laser diode drive current controlling circuit when the result of the comparing step is smaller than or equal to the minimum value of the threshold values; and

lowering the bias current by the laser diode drive current controlling circuit when the result of the comparing step is larger than or equal to the maximum value of the threshold values.

on the basis of a comparison made by the optical output comparing step, feeding the result back to the laser diode drive current controlling circuit when the result is outside the range of the threshold values, raising the bias current by the laser diode drive current controlling circuit if the result is smaller than or equal to the minimum value of the threshold values, and lowering the bias current by the laser diode drive current controlling circuit if the result is larger than or equal to the maximum value of the threshold values.